

WHAT IS CLAIMED:

1. A method of forming a power semiconductor device having an active region that includes a drift region, the method comprising the steps of:

forming, in a layer provided on a semiconductor substrate, a power semiconductor device having an active region that includes a drift region; and,

removing at least a portion of the semiconductor substrate below at least a portion of the drift region such that said at least a portion of the drift region is provided in a membrane defined by that portion of the layer below which the semiconductor substrate has been removed.

2. A method according to claim 1, wherein said at least a portion of the semiconductor substrate is removed by wet etching.

3. A method according to claim 1, wherein said at least a portion of the semiconductor substrate is removed by dry etching.

4. A method according to claim 2, wherein said at least a portion of the semiconductor substrate is removed using a buried insulating layer as an etch stop.

5. A method according to claim 1, wherein at least one semiconductor layer is introduced by implantation, diffusion or deposition from the back-side of the device following the formation of the membrane.

6. A method according to claim 1, wherein a bottom terminal layer is applied to the bottom of the membrane,

said bottom terminal layer being in contact with at least one semiconductor layer within the membrane.

7. A method according to claim 1, comprising the step of applying an electrically insulating and thermally conductive layer adjacent the bottom surface of the membrane.

8. A method according to claim 7, wherein the electrically insulating and thermally conductive layer is applied by a deposition process.